

Remarks

Claims 13-26 remain pending in the above-identified application and are submitted for the Examiner's reconsideration.

The Examiner objected to the drawing because she believes that it does not illustrate certain of the limitations recited in certain of the claims. Applicants have submitted herewith Figures 2 and 3, which shows the subject matter that the Examiner discusses in this objection. No new matter is presented with these drawings. Accordingly, withdrawal of this objection is respectfully requested.

Claims 13-17 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 4,456,390 to Junkert et al. (hereinafter "Junkert"). Claims 13-20 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 6,348,650 to Endo et al. (hereinafter "Endo"). In order for a reference to anticipate a claim, "every element of the claimed invention must be identically shown in a single reference." In re Bond, 910 F.2d 831, 832, 15 USPQ2d 1566, 1567 (Fed. Cir. 1990)(emphasis added). Applicants respectfully submit that Junkert or Endo does not identically teach every element of the claimed invention because Junkert or Endo does not show at least one of a first material and a second material of a thermocouple being at least regionally configured in the form of one of a meander-shaped and an undulating-type circuit trace. In contrast, both Junkert and Endo show thermopiles that are in the shape of starbursts. See element 12 in Junkert and Figure 1 of Endo.

Furthermore, the meander- or undulating-type structure in claim 13 results from an individual thermocouple, while in the related art the entire thermopile is star-shaped. The terms "thermocouple" and "thermopile" must not be mixed up. According to IEEE Standard Dictionary of Electrical and Electronics Terms", John Wiley & Sons, Inc., 1977, a thermopile is "a group of thermocouples connected in series aiding". Thus, a plurality of thermocouples in series form a thermopile.

According to the description, the star-shaped pattern in Junkert shows a thermopile, not an individual thermocouple ("Fig. 3 is a plan view, broken away, of a typical thermopile", column 2, lines 39-40). It is not described what shape an individual thermocouple has. According to Figure 3, the individual thermocouples appear to have a simple linear shape.

The proposed individual silicon layers 3 from Endo are likewise in the form of strips, and only a plurality of radially arranged silicon layers form the star pattern ("... in which many n-type polycrystalline silicon layers 3 are formed radially in a striped shape ...", column 16, lines

11-13). These strip-shaped silicon layers are switched in series by a metal film layer (“... the thermoelectric elements are connected in series by the metal film layers 7 to form the series of thermoelectric elements, terminals ...”, column 14, lines 29-31) and in this way form a thermopile having a star pattern.

Incidentally, it is explicitly stated in the present specification that the drawing from Figure 1 shows precisely one thermocouple and that a plurality of these thermocouples may be arranged in series in a cross or star shape, i.e., the star-shaped pattern of the thermopile known from the cited references has been described in the present specification, but is not part of the invention. (“A plurality of thermocouples 20 may be created on the surface of this supporting body 12. They may be connected in series and arranged in a cross-pattern or star-pattern. As illustrated in Figure 1, which only illustrates one of these thermocouples 20, ...”, page 6, lines 10-14, of the present specification). Accordingly, withdrawal of the rejection of claim 13 is respectfully requested.

As for claims 14, 19, and 20, Applicants submit that these claims are patentable for at least the same reasons given in support of the patentability of claim 13.

Claim 22 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Endo in view of United States Patent No. 6,297,723 to Shoji et al. (“Shoji”). Since Shoji does not overcome the deficiencies noted above with respect to claim 22, Applicants submit that claim 22 is patentable for at least the same reasons given in support of the patentability of claim 13.

Claims 21 and 23-26 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Endo in view of United States Patent No. 6,159,300 to Hori et al. (“Hori”). Since Hori does not overcome the deficiencies noted above with respect to Endo, Applicants submit that claim 21 is patentable for at least the same reasons given in support of the patentability of claim 13.

Notwithstanding the above, Applicants provide the following additional reasons in support of the patentability of claim 21 and also of claims 23-26. The Examiner relies on Hori to show the claim limitation of a second material of a thermocouple including platinum. Hori pertains to a photovoltaic device and a method and device for manufacturing such a device. Hori mentions thermocouples 117 as being part of the apparatus for manufacturing the photovoltaic device. Column 5, lines 59-64; column 6, line 49, to column 7, line 8. Hori does not detail the particular construction of the thermocouple 117 used in the manufacturing apparatus of Figure 1, and certainly does not mention that it includes platinum. Therefore, nothing regarding the thermocouple 117 of Hori can be used to establish that the prior art

teaches the use of platinum in the thermocouple recited in the claims. Although Hori does mention platinum as a material for the photovoltaic cell, Applicants dispute the underlying assumption that has brought the Examiner to rely on this reference, namely, that materials used for photovoltaic cells are equally relevant to materials used for thermocouples. Respectfully, Applicants note that the Examiner has not provided any specific factual basis for establishing this assumption. Unless the Examiner presents evidence to the contrary, the use of platinum in photovoltaic cells does not amount to a teaching of the use of such an element in thermocouples. Accordingly, in view of this discussion, withdrawal of the rejection of claims 21 and 23-25 is respectfully requested.

The Examiner wants to combine Endo and Hori, because Endo, while introducing a thermocouple, does not describe either the first material poly-SiGe claimed by Claim 23 or the second material, platinum. In Hori, the two materials are indeed named, but here as materials for a photoelectric element. Therefore, one skilled in the art, even when having knowledge of the Hori teaching, will not deduce to use these materials for a thermocouple as well, since the respective selection criteria of the materials differ. In the present specification, it can be gathered explicitly that this material combination is suitable for a thermocouple due to its low thermal conductivity (page 3, lines 22-33, of the present specification). Concrete values or value ranges with regard to the thermal conductivity are even mentioned (page 7, lines 17-20, of the present specification).

However, material-specific questions regarding the thermo-electric effectiveness cannot be gathered from Hori since other material properties, such as the light sensitivity, are more important for a photoelectric element. Applicants note, in particular, that Hori does not even propose platinum for the circuit traces, but as material for the substrate (column 8, lines 1-3, Hori). Selected for this purpose were materials having mechanical stability and only little deformation and bias (column 7, lines 65-67). For one skilled in the art such knowledge is irrelevant when searching for materials for a thermocouple.

The present invention is new, non-obvious, and useful. Reconsideration and allowance of claims 13-26 are respectfully requested.

Respectfully submitted,

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